

## Structural interface polariton modes

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The appearance of localized polariton modes at the interface separating two dielectric media requires the formation of electromagnetic evanescent waves on each side of the interface, supplemented by wave-vector dependent, incidental, conditions relating the dielectric constants of both media. At the junction of homogeneous materials, this sets very stringent requirements which can only be met by dispersive materials in narrow frequency ranges. These include infrared polar dielectrics with phonon polaritons and metallo-dielectric interfaces with plasmon polaritons [1].

When homogeneous media are replaced by structured interfacial metamaterials, the appearance of localized modes depends on very different conditions. Evanescent waves can arise from multiple reflections on the metamaterial interfaces and the boundary matching at the junction of metamaterials can also be tuned by a structuration of the connecting layer.

This communication will investigate several examples of structural interface polaritons, i.e. polaritons arising from the spatial structuration of metamaterials. The possibility of their study via attenuated total reflection or electron energy-loss experiments will be discussed.

- [1] A. Dereux, J. P. Vigneron, P. Lambin, and A. A. Lucas, *Phys. Rev. B* **38**, 5438 (1988); G. Eliasson, G. F. Giuliani, J. J. Quinn, and R. F. Wallis, *Phys. Rev. B* **33**, 1405 (1986).